

## ADDITIONS TO THE INVENTORY OF THE SEA SLUGS (OPISTHOBRANCHIA AND SACOGLOSSA) FROM GUADELOUPE (LESSER ANTILLES, CARIBBEAN SEA)

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### RESUMEN

Se presenta una lista sistemática de 23 especies de babosas marinas, 18 opisthobranquios y 5 sacoglossos, recolectadas por primera vez en la isla de Guadalupe durante la misión Karubenthos-2012 (mayo y diciembre de 2012). Adicionalmente, se describen 1 género y 8 especies nuevas para la ciencia (6 opisthobranquios y 2 sacoglossos). Con estas aportaciones el inventario general alcanza las 149 especies, de las cuales 9 han sido de nueva descripción.

**Palabras claves:** Mollusca, Opisthobranchia, Sacoglossa, isla de Guadalupe, mar Caribe, género nuevo, especies nuevas.

### ABSTRACT

A systematic list including 23 species of sea slugs, 18 opisthobranchia and 5 sacoglossa, recorded for the first time in Guadeloupe Island, is herein presented. These species were collected during the expedition Karubenthos-2012 (may and December 2012) hosted by the National Museum of Natural History in Paris. Additionally, 1 new genus and 8 new species (6 opisthobranchia and 2 sacoglossa) are described. With this contribution, the inventory of the sea slugs from Guadeloupe raises to 149 species, 9 of them newly described.

**Key words:** Mollusca, Opisthobranchia, Sacoglossa, Guadeloupe island, Caribbean sea, new genus, new species.

### 1. INTRODUCTION

The sea slugs from Guadeloupe have recently been revised by ORTEA, ESPINOSA, CABALLER & BUSKE [11], who listed 127 species, 117 of which were collected on the expedition Karubenthos (may 2012) hosted by the National Museum of Natural History in Paris (MNHN). Of these, 85 were new records for Guadeloupe and 1 was new for science.

The second part of Karubenthos took place in Guadeloupe in December 2012, a complementary sampling designed to collect the remaining sea slugs not found in the main body of the expedition, due to seasonality or because they are associated to habitats not sampled before. As a result, 23 species not recorded before in the Archipelago have been captured, of whom, 8 are new to Science. This work deals with the actualization of the inventory of the sea slugs from Guadeloupe and with the description of 1 new genus and several new species for science.

## 2. MATERIALS AND METHODS

The fieldwork took place in Guadeloupe, from December 3<sup>rd</sup> to December 14<sup>th</sup>, 2012. The specimens were collected by direct search or, indirectly, by scraping, brushing or examination of algae or other substrates collected by wading, snorkeling or scuba diving. A total of 21 stations (GR56-GR77) were visited, from the shore to 36 m depth. All samples were processed onshore; placed in trays for examination and selection of specimens in a temporary laboratory, installed by the MNHN in the Marine Biology facility of the Guyana University. The original name of the stations in French, has been kept to avoid discrepancies with the general list of stations of the expedition.

## 3. SYSTEMATICS

ADDITIONS TO THE INVENTORY OF SPECIES OF ORTEA *ET AL.* [11]

### Subclass OPISTHOBRANCHIA

#### Order CEPHALASPIDEA

Family BULLIDAE Gray, 1827

Genus *Bulla* Linné, 1758

#### ***Bulla solida* Bruguière, 1792**

One specimen alive on each of the following stations: GM05 (Bahie Mahault, La Manche à eau, 1 m); GM24 (Grand Cul Sac Marin, Banc-Frotte-ton-cul, 2 m); GR73 (Mangroves de Rivière, 0-1.5 m, on sediments in seagrass meadows among the roots of magle). According to MALAQUÍAS & REID [8], *Bulla striata* Bruguière, 1792 is only present on the Eastern Atlantic, thus, all the records to this species in Guadalupe must be rejected.

#### Order RUNCINACEA

Familia RUNCINIDAE H. & A. Adams, 1854

Genus *Karukerina* Ortea, new genus

Type species: *Karukerina antola* Ortea, new species.

**Diagnosis:** Body elongated, wider posteriorly. Foot rounded posteriorly. Internal shell present and very weak. Gill wide, with the anus below. Anus stalked. Jaws triangular, with scales and canes on the anterior end. Posterior end of the jaws thickened and smooth. Radula lacking rachidean teeth (n x 1.0.1). Radular teeth simple, hook-shaped, intercrossing with the ones on the other half. Four gastric plates.

**Etymology:** *Karukerina*, for Karukera (island of beautiful waters), name by which the ancient inhabitants of Guadeloupe, knew the island.

**Remarks:** The family Runcinidae H. & A. Adams, 1854 includes 7 genus, of which, only 3 have representatives in the Atlantic: *Lapinura* Marcus & Marcus, 1970, *Runcina* Forbes & Hanley, 1853 and *Edmundsina* Ortea, 2013 (previously described in this volume). All the known species of the family Runcinidae bear rachidean teeth in the radula, this character, together with the absence of internal shell, distinguish *Karukerina* Ortea, new genus, from all of them. *Lapinura divae* (Marcus & Marcus, 1963), the only representative of the monotypic genus *Lapinura*, which is distributed all along the Caribbean, has an external cup-shaped shell beside the gill, this character distinguishes it from *Karukerina* Ortea, new genus. *L. divae* was originally described on the genus *Ildica* Bergh, 1889, due to its laminated external shell. The species of the genus *Metaruncina* Baba, 1967, have an internal shell, but an asymmetric radula. The representatives of the genus *Pseudoilbia* Miller & Rudman, 1968 (Order Runcinacea) lack a rachidean teeth (n x 2.0.2), but they also lack gastric plates, thus, they are included in the family Ilbiidae Burn, 1963.

### ***Karukerina antola* Ortea, new species**

(Plates 1 A-C & 2)

**Material examined:** Oeil (type locality, 16°26.78'N 61°32.41'W), GR35, Port-Louis, Guadeloupe, May 18, 2012, 2 specimens 2-3 mm long alive (1.8 mm fixed), collected at 15 m depth. One of the specimens dissected, the other designated as holotype and deposited in the molluscan collections at the National Museum of Natural History in Paris (MNHN 26967).

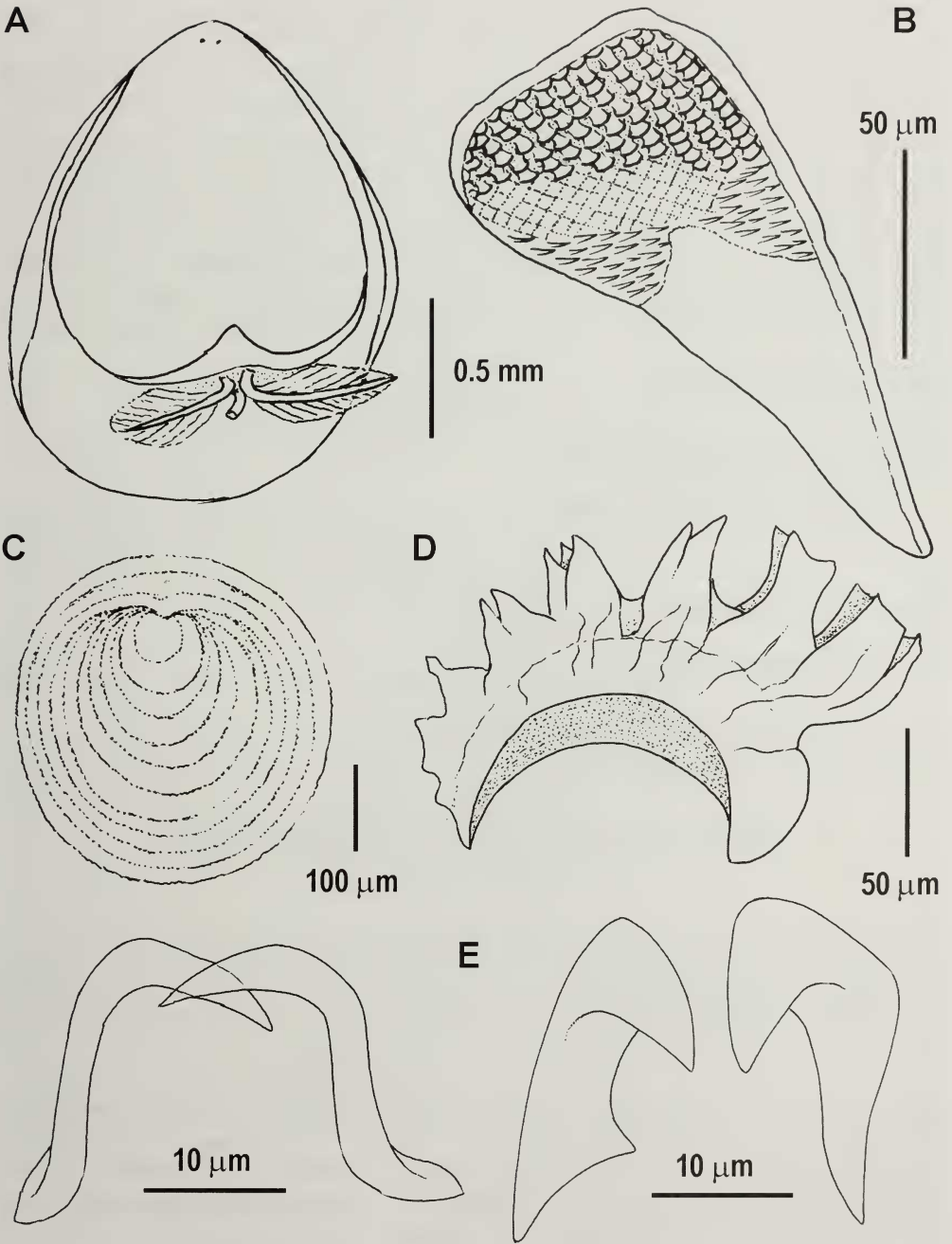
**Etymology:** Dedicated to the creole food restaurant *Anto-la*, “gastronomic base” of the expedition Karubentos-1. Its peculiar terrace is a pleasant memory of the place where the dish of the day became the daily dish; the cucumber salad.

**Description:** Body translucent green, with aggregations of brilliant white points densely concentrated on the dorsum, scattered in the tail and in the edges of the foot. Head narrow, square-shaped, with two triangular white patches on each side. Eyes very close together and hardly visible by transparency, located between the triangular patches. Body progressively widened from front to back. Posterior end of the mantle with a notch that forms two asymmetric lobes. Gill under the lobes of the mantle, composed of two fanned yellowish green leaflets (Plates 1 B & 7 A). Anus stalked, slightly shifted to the right of the body. Tail wide and rounded. No external shell associated to the gill. Internal shell present, but not visible by transparency.

Jaws 150 µm long x 70 µm wide, with high density of scales (up to 16 on each row) and canines on the anterior third (Plate 2 B); the rest is smooth, with two of the three edges thickened. Radular formula 22 x 1.0.1. Radular teeth 20 µm long (Plate 2 E), simple, hook-shaped, intercrossing with the ones on the other side. Four gastric plates (Plate 2 D) 150 µm long, with 7 crusher plates each: the first one with a thin sheet above, and the third and fourth with opposite orientation. Shell thin, patelliform, 400 µm long (Plate 2 C), behind the gastric plates, above the visceral mass.



Plate 1.- *Karukerina antola* Ortea, new genus, new species, holotype: A. Dorsal view. B. Detail of the gills. C. Ventral view, foot sole. D. *Aegires sublaevis* Odhner, 1932 in dorsal view. *Aegires ochum* Ortea, Espinosa & Caballer, new species, holotype: E. Dorsal view. F. Detail of the head.



**Plate 2.-** *Karukerina antola* Ortea, new genus, new species: **A.** Scheme of the gill and anus in the back of the body. **B.** Jaw. **C.** Internal shell in dorsal view. **D.** Gastric plates. **E.** Radular teeth in different orientations.

**Remarks:** The most recent contribution to the inventory of Caribbean sea Runcinidae is owed to ORTEA, MORO & ESPINOSA [13], who describe two new species collected off the coast of Cuba, of them, *Runcina dorcae* Ortea, Moro & Espinosa, 2007, also has a large gill, but composed of five unipinnate leaves instead of the two fan-shaped leaves of *Karukerina antola* Ortea, new species. Additionally, *R. dorcae* is large (8 mm), globose, stocky, orange and lacks white spots, quite different from *K. antola* Ortea, new species. The most common species in the Caribbean, *Lapinura divae*, is distinguished because it has an external shell associated to a small gill and his radula has a rachidean teeth. There are two other Caribbean species that shall be compared to *K. antola* Ortea, new species, even when they haven't been seen after its original description: *Runcina inconspicua* Verrill, 1901, from Bermuda, whose lateral foot edge is wavy and exceeds the mantle, and *Runcina prasina* (Mörch, 1863), from the island of Saint Croix, with warts on the mantle. Both of them are different from *K. antola* Ortea, new species.

## Order APLYSIOMORPHA

Family APLYSIIDAE Lamarck, 1809

Genus *Aplysia* Linné, 1758

*Aplysia brasiliiana* Rang, 1828

GS02, canal de îlet à Colas, 15 m depth, 1 juvenile specimen.

## Order NUDIBRANCHIA

### Suborder DORIDACEA

Family GONIODORIDIDAE H. & A. Adams, 1854

Genus *Aegires* Lovén, 1844

*Aegires ochum* Ortea, Espinosa & Caballer, new species

(Plate 1 E-F)

**Material examined:** Pointe de La Fontaine (type locality: 16°27.74'N; 61°31.84'W), GR30, Anse Bertrad, May 17, 2012, 1 specimen 7 mm long, collected in a semi-dark cave at 18 m depth. Designated as holotype and deposited in the molluscan collections at the National Museum of Natural History in Paris (MNHN 26968). When fixed, the animal changes to copper colored and the mantle becomes smooth.

**Etimology:** Named to honour *Ochum*, god of the water in the Yoruba religion (professed in Guadeloupe), represented by the yellow color. Also named in memory of the roundabout "Elegua Square", as we called it, near the University of Fouillole in Pointe-à-Pitre, that hosts a symbol of this religion, a mandatory crosspoint on our way to the Biological Station of the University of Guyana during the mission Karubentos.

**Description:** Animal very slow and very stiff. Body intense yellow, with copper-colored spots and rounded blotches, with some lateral humps and an embossed net of cords of different thickness, which constitute a characteristic grid. Head with 2 thick rounded tubercles and less copper-colored spots. Rhinophores yellow with faded coppery spots and the apex slightly staggered. They arise from the inner base of a large rounded tubercle.

The gill consists of five white bipinnate leaves, protected ahead by three large tubercles, of which the central one is the most developed.

**Remarks:** The external anatomy of this species is very characteristic, thus, the holotype has been preserved intact. Due to the coloration of the body, *Aegires ochum* Ortea, Espinosa & Caballer, new species, may resemble to the yellow morph of the amphiatlantic species, *Aegires sublaevis* Odhner, 1932 (Plate 1 D), originally described in the Canary islands and also collected in Guadalupe during the expedition Karubentos-1 (GD57 station, at 6 m depth). A simple comparison of the two species (Plates 1 D & 1 E) shows that they only share the color. The surface of the mantle, the rhinophores and the gill are very different in both, and distinguish *A. sublaevis* from *A. ochum* Ortea, Espinosa & Caballer, new species. There are other 3 western Atlantic species, two from the Caribbean Sea (*Aegires ortizi* Templado, Luque & Ortea, 1987 and *Aegires gomezi* Ortea, Luque & Templado, 1990) and one from Brazil (*Aegires absalaoi* García, Troncoso & Domínguez, 2002), but they have quite different body architecture, based on tubercles, and their colorations are different from that of *A. ochum* Ortea, Espinosa & Caballer, new species.

Family CHROMODORIDIDAE Bergh, 1891

Genus *Hypselodoris* Stimpson, 1855

***Hypselodoris espinosai* Ortea & Valdés, 1996**

GR59, îlet Fortune, rocky slope with gorgonians between 1.5 and 7 m deep.

#### **Description of four new species of *Hypselodoris* Stimpson, 1855 from Guadeloupe**

The recent description of *Hypselodoris samueli* Caballer and Ortea, 2012 from Venezuela (CABALLER & ORTEA [1]), includes a compilation of the contributions to the study of the genus *Hypselodoris* in the western Atlantic after the revision owed to ORTEA, VALDÉS & GARCÍA-GÓMEZ [15]. In this work, 4 new species from Guadeloupe are described, two of them related to *Hypselodoris acriba* Marcus & Marcus, 1967 for its coloration pattern, the third akin to *H. samueli* and, the last, related to *Hypselodoris ruthae* Marcus & Hughes, 1974.

Recently, JOHNSON & GOSLINER [7] transferred all the Atlantic species of *Hypselodoris* to *Felimare* Marcus & Marcus, 1967, a genus that was originally poorly constructed, based on the existence of a rachidean tooth in the radula that has never been observed by later authors. According to them, the molecular data indicate that the Atlantic species of *Hypselodoris* belong to a different genus than those from the Indo-Pacific, but there is not anatomical evidence to support this statement, nor to justify the creation of geographic genres as the basis for zoological arrangement. Taxonomy is hierarchical, thus, to classify one species in one genus, this taxa has to match in the diagnosis of the genus, not vice versa. The geographic arrangement without an anatomical basis is not possible. JOHNSON & GOSLINER [7] fail to establish the diagnosis of *Felimare* or *Hypselodoris*, and given that any of the Atlantic species of *Felimare* has a rachidean tooth in the radula, the diagnostic differences between *Felimare* and *Hypselodoris* would be exclusively, living in the Atlantic or living in the Indo-Pacific. As an example: *Hypselodoris lapolislazuli* (Bertsch & Ferreira, 1974), endemic to the Galapagos Islands, has a very small blood gland compared to other *Hypselodoris*, but also has a muscular pump in the vas deferens that propels the sperm (ORTEA, BACALLADO & VALDÉS [9]). This anatomical differences that distinguish *H.*

*lapislazuli* from the rest of its congeners, are of a greater magnitude than those between the type species of *Hypselodoris* (Indo-Pacific) and any of its representatives in the Atlantic, as *Hypselodoris picta* (Schultz, 1836), amphi-atlantic, or *Hypselodoris tricolor* (Cantraine, 1835), distributed through northern Spain, Azores, Canary Islands and the Mediterranean. As traditional taxonomists, we understand that the typical characters of *H. lapislazuli* constitute interspecific differences, which do not justify the description of a new genus. The genera should be proposed when there are diagnostic characters of main importance, but they must not be created to introduce unjustified fragmentation of taxa. In any case, the proposal of JOHNSON & GOSLINER [7] must be understood within the framework of molecular systematics. The classification of the Animal Kingdom has always been subject to the criteria of each of the historical specialists, but at the end, only the species and the specific epithets survive to the changes in the zoological arrangement. The compilation on the changes in the arrangement of the Opisthobranchia over time, given by WAGELE, KLUSSMANN, VERBEEK & SCHRODL [20], is a good example of this.

### ***Hypselodoris alaini* Ortea, Espinosa & Buske, new species**

(Plates 3 A-D, 4 & 9 A)

**References:** *Hypselodoris* cf. *acriba*: VALDÉS, HAMANN, BEHRENS & DUPONT [19]: 160, from Saint Martin.

**Material examined:** Petit-Havre, (16°12.5'N 61°25.5'W), GR57, December 4, 2012, 1 specimen 45 mm long, collected on a sandy bottom with rocky and coral debris between 10 and 13 m depth. Port-Louis (type locality: 16°23.2'N 61°31.7'W), GR70, December 11, 2012, 2 specimens 30 and 40 mm long with a spawn, collected on a coral rock slope between 10 and 25 m depth. Designated as holotype the 40 mm long specimen from Port-Louis and deposited in the molluscan collections at the National Museum of Natural History in Paris (MNHN 26969).

**Etimology:** Named in honor to Alain Goyeau, an expert on the underwater nature of the Guadeloupe and the owner of the diving club of Port-Louis, where the type locality of this beautiful species is located. In gratitude for his collaboration with the mission Karubenthos.

**Description:** Body elongated and tall, with a light blue background and an irregular dorsal lattice formed by three orange areas alternating with three yellow (Plate 3 A-B). In the anterior region, ahead and around the rhinophores, the lattice is orange and on the gills and ahead the gills it is yellow. Between these two regions, there are two yellow and two orange areas, alternating each other, the latter half as big as the yellow ones.

Tail 10 mm long when crawling (in the 45 mm long specimen), with the yellow lattice from the flanks joining on it. Oral appendages blue-violet on the distal half and pale blue in the rest. Mantle edge white, with bluish-black spots, bordered out with a thin pinkish line. This line becomes reddish and more intense in the posterior region, behind the gill, ahead the rhinophores and in the middle of each side of the body; where the mantle edge is interrupted by the dorsal orange lattice, which turns dark brown or black on the outer edge. MDFs in the mantle edge, except in the medial region, ahead the rhinophores, behind the gill and in the areas invaded by the orange lattice. The largest MDFs between the lateral orange regions, and the gill (Plate 9 A). Body sides covered by the orange lattice over pale blue background with some black spots. Foot edge similar to mantle edge; white with bluish black spots, slightly hya-



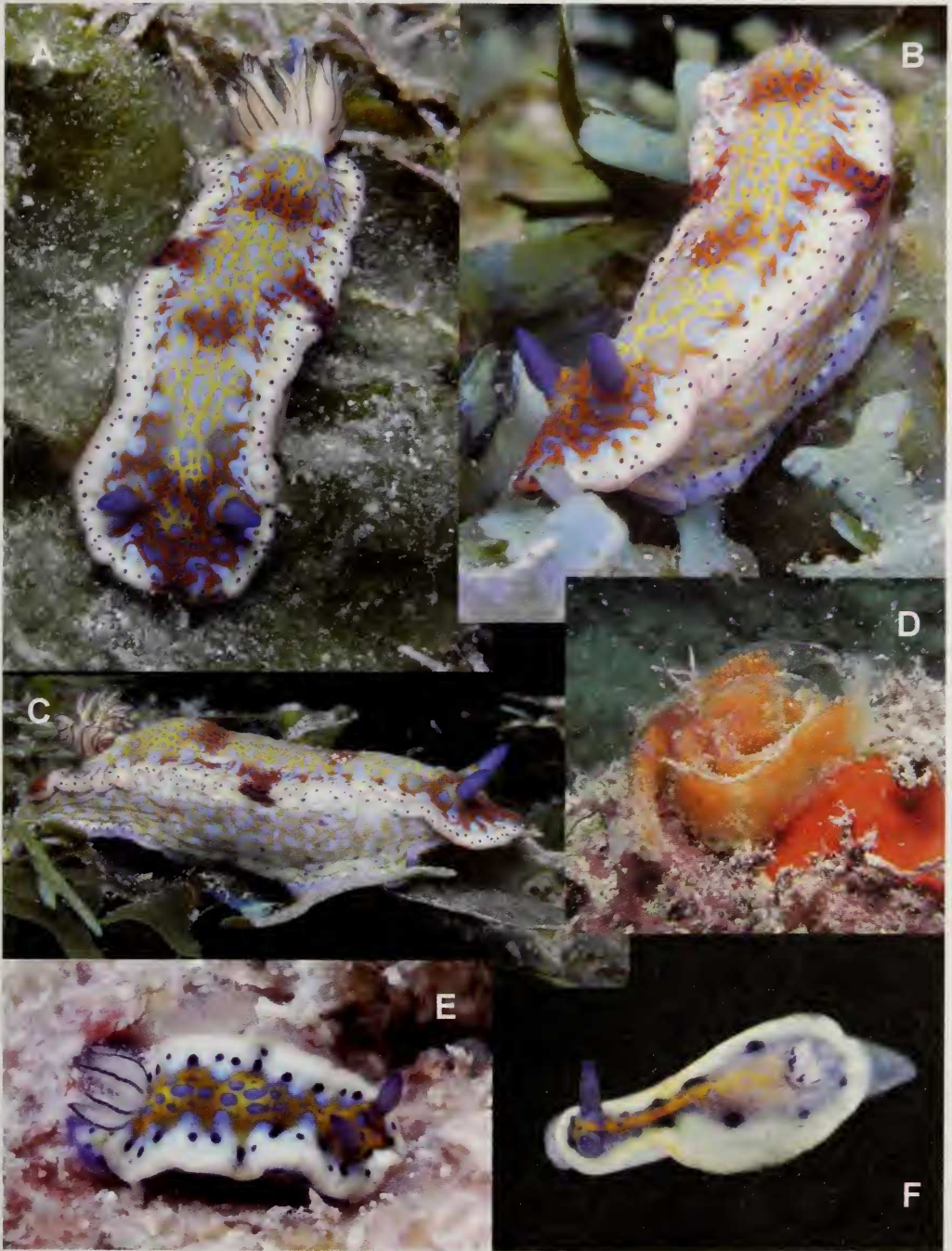


Plate 3.- *Hypselodoris alaini* Ortea, Espinosa & Buske, new species, 45 mm: A. Fronto-ventral view. B. Fronto-lateral view. C. Lateral view. D. Spawn. *Hypselodoris fortunensis* Ortea, Espinosa & Buske, new species: E. Dorso-lateral view. F. Dorsal view, juvenile.

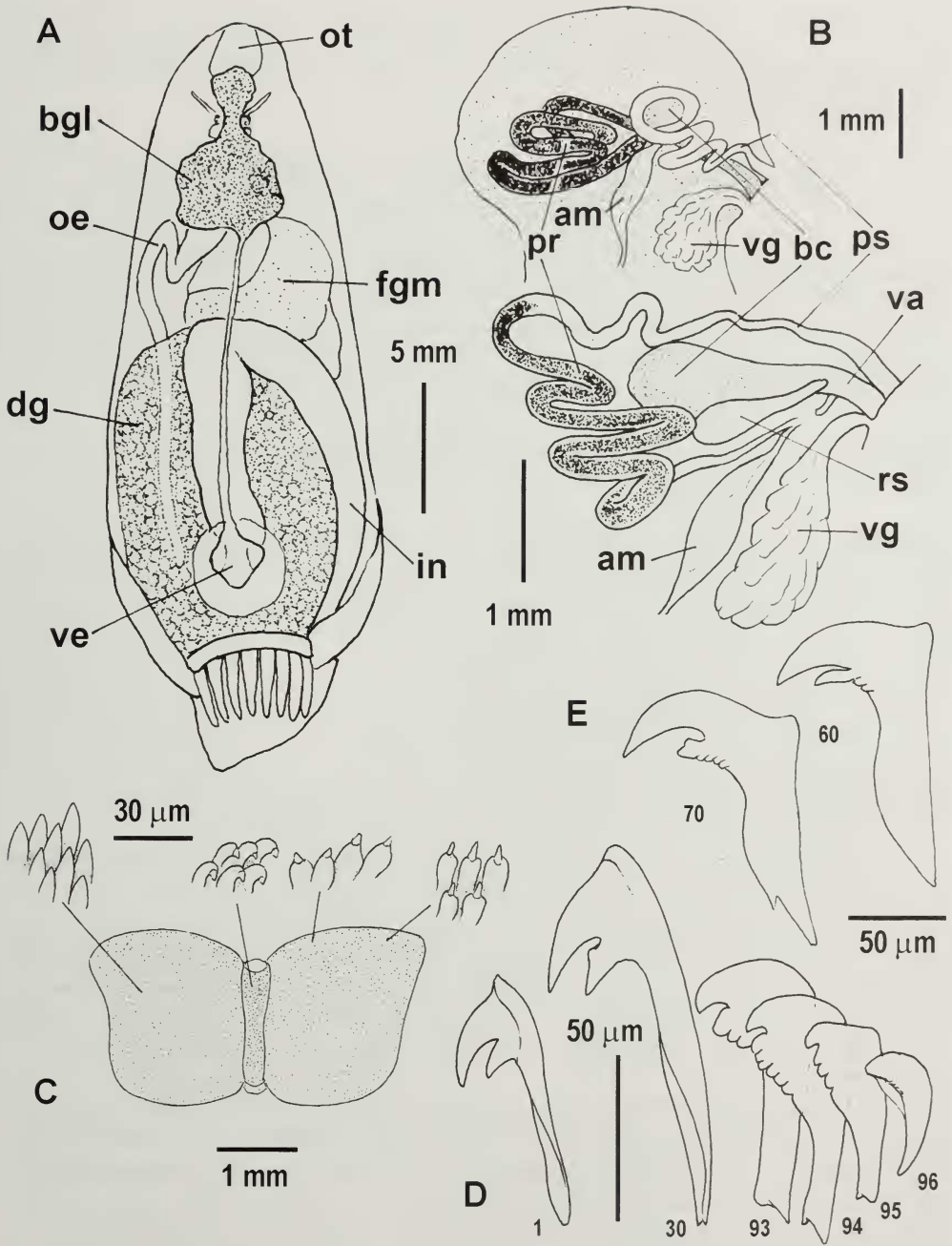
line in the outermost edge. Rhinophores intense blue, with bright blue apex, ended in a small tip, with more than 30 rhinophoral lamellae (holotype), tightly arranged, nearly horizontal. Rhinophoral sheaths high, with blue background and the orange lattice. Gill consists of 13-16 unipinnate branchial leaves. Branchial leaves with black rachis, white lamellae, some of them branched distally; producing bifid and trifid structures. Gonopore in the right side of the body, in the middle-anterior zone of the hipnotum, surrounded by yellow pigment in bright blue background.

Blood gland big, slightly constricted by the cerebroid ganglia (Plate 4 A). Digestive tract with a very long oesophagus, with an anterior fold, reaching the digestive gland on its internal posterior region. Jaw (Plate 4 C) composed of two quadrangular pieces, as high as wide (1.8 mm), and a third dorsal sinuous piece. The whole surface covered by regular spear-shaped rodlets, except on the free edge, where they are more pointed. Rodlets on the dorsal piece are curved backwards as a hook. Radular formula 65 x 96.0.96. (30 mm long fixed specimen). Radular teeth bicuspid, lacking denticles up to number 40; from 41 to 50 with one denticle; from 51 to 60, two denticles; from 70, four denticles. From tooth number 30, there is a characteristic denticle on the second cusp. Size of the teeth increases in the row up to number 65. Innermost lateral teeth bicuspid (Plate 4 D), with a large base (70  $\mu$ m). Outermost lateral teeth robust and triangular (Plate 4 E), with 4 blunt denticles on the edge, below the first cusp, similar to those of *Hypselodoris acriba* (which bears 6-7 denticles).

Reproductive system (Plate 4 B) is similar to that of *Hypselodoris acriba*, illustrated by ORTEA et [15], but with very different proportions. Vas deferens white, long. Back of the bursa copulatrix almost hidden completely by the vas deferens. Prostatic region black, composed of several tightened folds. The bursa copulatrix is a flattened and elongated sac, typically golden brown, which highlights due to the white vas deferens surrounding it. Seminal receptacle also saccular, elongated and golden brown, inserted in the bursa on its basal third. Hermaphroditic gland white, equal length than the bursa. Vestibular gland present. The spaw (Plate 3 D) is a ribbon coiled three times, with rigid walls, with a gelatinous matrix, which contains large orange eggs, bigger than 200  $\mu$ m, irregularly arranged with spaces between them. The ribbon can contain a maximum of 10 eggs width.

**Remarks:** Due to the dorsal coloration: a yellow lattice on a blue background, *Hypselodoris alaini* Ortea, Espinosa & Buske, new species, is related with *Hypselodoris acriba* and with *Hypselodoris marci* Marcus, 1971, but these two species, have a wavy dorsal ridge in the mantle edge. Additionally, the yellow lattice in *H. acriba* has no dorsal orange intermediate zones as in *H. alaini* Ortea, Espinosa & Buske, new species, and *H. marci*, which has pale yellow rhinophores, with a dark brown band and the apex indigo blue, very different from the uniform intense blue rhinophores of *H. acriba* and *H. alaini* Ortea, Espinosa & Buske, new species. DOMÍNGUEZ [3] and DOMÍNGUEZ, GARCÍA & TRONCOSO [4] redescribed *H. marci* based on specimens from Brazil, giving stability to a species originally described from Venezuela and Brazil (GARCÍA, DOMÍNGUEZ & TRONCOSO [6]).

Other big-sized atlantic *Hypselodoris* with uniform dark blue rhinophores are *Hypselodoris picta* (Schultz, 1836), *Hypselodoris zebra* Heilprin, 1888, *Hypselodoris bayeri* (Marcus & Marcus, 1967), *Hypselodoris juliae* Dacosta, Padula & Schrold, 2010 and *Hypselodoris samueli*, but in all these species, the dorsal coloration is composed of parallel or adjacent yellow lines, more or less tightly arranged, on a dark blue background. *H. zebra*, endemic to Bermuda, reaches 118 mm, have direct development and has a gold yellow lattice on a dark blue background on the back, whose complexity increases with size,



**Plate 4.-** *Hypselodoris alaini* Ortea, Espinosa & Buske, new species. 30 mm specimen: **A.** Scheme of the internal anatomy. **B.** Scheme of the reproductive system. **C.** Jaw and jaw rodlets. **D.** Innermost lateral teeth and outermost lateral teeth (number in the figure). **E.** Radular teeth (number in the figure). Abbreviations: am, ampulla; bc, bursa copulatrix; bgl, blood gland; dg, digestive gland; fgm, female gland mass; in, intestine; oe, esophagus; ot, oral tube; pr, prostate; ps, penial duct; rs, seminal receptacle; va, vagina; ve, ventricle; vg, vestibular gland.

but lacking the intermediate orange zones shown in *H. alaini* Ortea, Espinosa & Buske, new species. VALDÉS, HAMANN, BEHRENS & DUPONT [19], illustrate a specimen of *H. alaini* Ortea, Espinosa & Buske, new species, from Saint Martin under the name *Hypselodoris cf. acriba*.

***Hypselodoris fortunensis* Ortea, Espinosa & Buske, new species**  
(Plates 3 E-F, 5, 9 C)

**Material examined:** Pointe Rivière Goyave (type locality: 16°8'23.98"N 61°32'59.46"W), GR64, December 7, 2012, 1 specimen 11 mm long, collected in a rocky bottom with sand and mud between 6 and 22 m depth, dissected to study the jaw and radula, designated as holotype and deposited in the molluscan collections at the National Museum of Natural History in Paris (MNHN 26971). Oeil (16°26'N 61°32'W), Port Louis, GB20, May 18, 2012, 1 juvenile 3 mm long captured at 16 m depth.

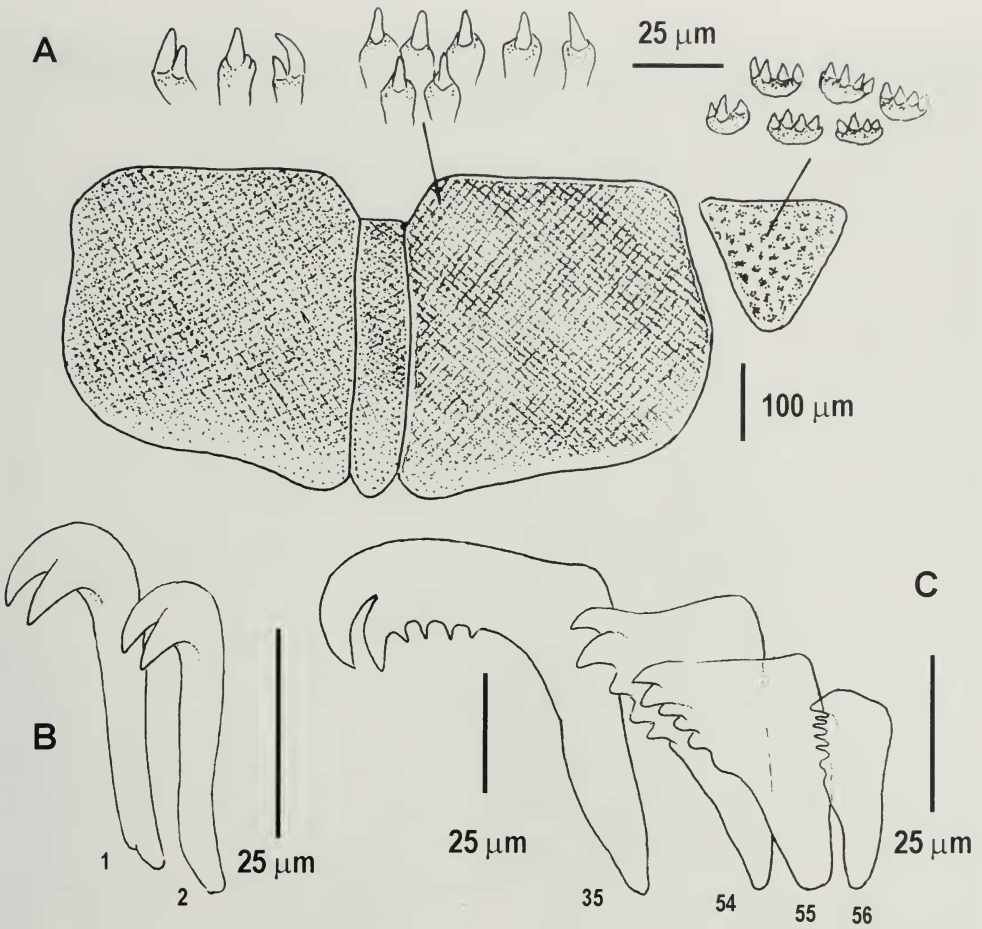
**Etimology:** Toponymic of îlet Fortune, the locality with the highest species richness of sea slugs observed in Guadeloupe during the mission Karubenthos.

**Description:** Body elongate, wider than high; flat and wide compared to other congeners (four times longer than wide). Mantle bright blue, with a network of yellow-orange pigment over it. Body sides pale blue, with black spots and a yellow line in the middle, interrupted in the tail, where there is a fine line of the same color and some black spots. Mantle edge large, white with black spots and edged out with a golden yellow line on all its contour; including the anterior and posterior ends of the body. A black speck marks the medio-lateral zone on the sides of the body. There are MDFs only behind the gill and ahead the rhinophores: In the 3 mm specimen, there are 5 MDFs in the posterior region and 9, smaller, in the anterior. In the holotype, there are 9 MDFs in the posterior region, growing from front to back, the central one the biggest, and 16 in the anterior, all equal-sized, 8 each side (Plate 9 C).

Holotype (Plate 3 E): Gill composed of 10 unipinnate branchial leaves with purplish black rachis and white lamellae. Rhinophores of a uniform intense blue color, with 12 lamellae. Rhinophoral and branchial sheaths stained by the same orange network as in the mantle. Foot violet blue, lighter than the rhinophores. Tail narrow, very sharp, protruding from behind; in its middle there is an orange streak and a black speck on each side of it. Juvenile (Plate 3 F): Gill composed of 5 unipinnate branchial leaves. Rhinophores uniform violet blue. Sides of the body bright blue, with a thin yellow line and a rudiment of the orange network.

Jaw (Plate 5 A) composed of 4 pieces; the two on the sides and the dorsal one have simple rodlets, which may have second cusp of smaller size occasionally. Rodlets in the ventral piece are plates with 3-4 cusps, similar to these in *Hypselodoris ruthae*, according to ORTEA *et al.* [15]. Radular formula 49 x 56.0.56. (holotype), with the teeth stained in blue in the firsts 30 rows and transparent in the rest. Radular cartilage much wider than the rows of teeth. Teeth base long in proportion to the hook, even in the outermost lateral teeth. Teeth bicuspid, with both cusps of similar size, up to reach the outermost marginals. The maximum number of denticles below the second cusp is four, at tooth number 40; the same number as in the outermost lateral teeth, though in there, they are deformed and rounded.

**Remarks:** *Hypselodoris fortunensis* Ortea, Espinosa & Buske, new species, is apparently related to *Hypselodoris acriba* by the coloration of the dorsum, but the jaw is clearly differ-



**Plate 5.-** *Hypselodoris fortunensis* Ortea, Espinosa & Buske, new species, holotype: **A.** Jaw and jaw rodlets. **B.** Innermost lateral teeth (number in the figure). **C.** Outermost lateral teeth (number in the figure).

ent in both species. The jaw of *H. fortunensis* Ortea, Espinosa & Buske, new species, is more similar to that of *Hypselodoris ruthae*, as described by ORTEA *et al.* [15]. On the other hand, the radular teeth, bearing two big cusps of similar size, certainly seem to be closer to the radular structure of *H. acriba*, although the teeth of *H. acriba* are shorter and more robust, with a maximum of three denticles below the second cusp, which is also shorter (ORTEA *et al.* [15]). *H. ruthae* has the second cusp of the radular teeth much smaller than the first, and similar to that of *H. bayeri*, which makes difficult the determination of the specimens deposited in collections, in the absence of illustrations of the living animals. This species may be present in Costa Rica where it might have been cited under the name *H. acriba* (ESPINOSA & ORTEA [5]).

*Hypselodoris fregona* Ortea & Caballer, new species  
(Plates 6 & 9 B)

**References:** *Hypselodoris* sp. 3: VALDÉS *et al.* [19]: 164, from Puerto Rico.

**Material examined:** Pointe sur baie de Baille Argent (type locality: 16°15'N 61°48'W), GD20, May 12, 2012, 1 specimen 26 mm long (18 mm fixed), collected in a rocky bottom at 35 m depth. Designated as holotype and deposited in the molluscan collections at the National Museum of Natural History in Paris (MNHN 26973).

**Etimology:** Named for the shape of the gill similar to a mop, a “fregona” in spanish, one of the most universal spanish patents. The way in which this species retracts the leaves of the gill reminds the typical drained by rotation of this household cleaning tool (Plate 6 G-H).

**Description:** Body elongated and tall, narrower, in relation to its length, than other congeners (up to 9 times longer than wide). Mantle light blue in the middle and white on the rest, with several bluish green bands from left to right between rhinophores and gill (Plate 6 A). There are 3 parallel continuous yellow lines on the dorsum; which become orange in the middle of the body and in the anterior region. Between the yellow lines, there are two additional discontinuous yellow lines. The three main lines on the dorsum join ahead of the rhinophores, forming an arc, and surrounding the rhinophoral sheaths, from which it emerges a small orange curved line that do not reach the central line. In the posterior region of the mantle, the middle yellow line touches the branchial sheath, the lateral lines surround it and the three lines join in a single one after the gill. Mantle edge outlined by a thin yellow line that turns orange in the areas where the lines on the dorsum are orange. On the white side of the mantle edge there are bluish green blotches and black spots, evenly spaced and similarly sized. Tail with three yellow lines and black spots, projected behind, with parallel sides which sharpen abruptly at the end, where it forms a characteristic obtuse angle. In the preserved specimen, the color of the body is gray with black spots; the yellow lines turn white. MDFs arranged in groups on the mantle edge, alternating with spaces lacking them. The largest MDFs (7) are behind the gill; the bigger one in the center with 3 on each side. On the edge sides, there are two groups of 3 MDFs each; between gill and rhinophores, before and after the orange segment. In the anterior region of the mantle edge, between the rhinophores, there are 2 arcs of 6-7 MDFs, one on each side. The frontal space lacks them (Plate 9 B). Throughout the sides of the body there are 3 parallel yellow lines and three sets of black spots; one between the top line and the edge of the mantle, whose background is white, and the other two in the bluish green space separating every two yellow lines. Between the bottom line and the edge of the foot, the background color is blue. The lines of each side join in the head, forming a collar that contrasts with the dark blue of the oral appendages. Gonopore (Plate 6 I) in the middle-anterior zone of the right side of the body, outlined by yellow pigment.

Rhinophores with 15 lamellae, very characteristic, white in front and behind, and dark blue in the stalk, on the sides and at the apex, where there is a tip. Rhinophoral sheaths high and outlined by the orange pigment of the lines of the mantle. The rhinophores retain the white coloration when fixed.

Gill very distinctive, composed of 10 unnipinnate branchial leaves with translucent lamellae. Rachis white in the lower half and dark blue at the top. When the animal retracts the gill, twists the branchial leaves before hiding, just as with a mop to drain and remove dirty water. When fixed, the gill becomes greyish with the lower half of the rachis white.



**Plate 6.**- *Hypselodoris fregona* Ortea & Caballer, new species, holotype: **A.** Dorsal view. **B.** Lateral view. **C.** Tail. **D.** Ventral view of the head. **E.** Dorsal view of the head. **F.** Detail of the rhinophore. **G.** Lateral view of the gills. **H.** Dorsal view of the gills. **I.** Detail of the gonopore.

**Remarks:** The body architecture of *Hypselodoris fregona* Ortea & Caballer, new species, is so distinctive that the only specimen was not dissected but preserved intact as holotype. Its color pattern is also unique among its congeners in the Atlantic. Only the upper half of the rhinophores of *Hypselodoris ruthae* have a similar design, but in *H. ruthae*, at the same size, there are at least 7 orange parallel lines on the dorsum, with a dark blue background and the gill is very different. The head with an orange collar and the sets of black spots on the flanks, are two characters that have not been described in other Caribbean species, nor the typical functionality of the gill, which make *Hypselodoris fregona* Ortea & Caballer, new species, a singular and unique taxon.

One specimen of this species has been illustrated and recorded from Puerto Rico under the name *Hypselodoris* sp. 3 by VALDÉS *et al.* [19].

### *Hypselodoris lalique* Ortea & Caballer, new species

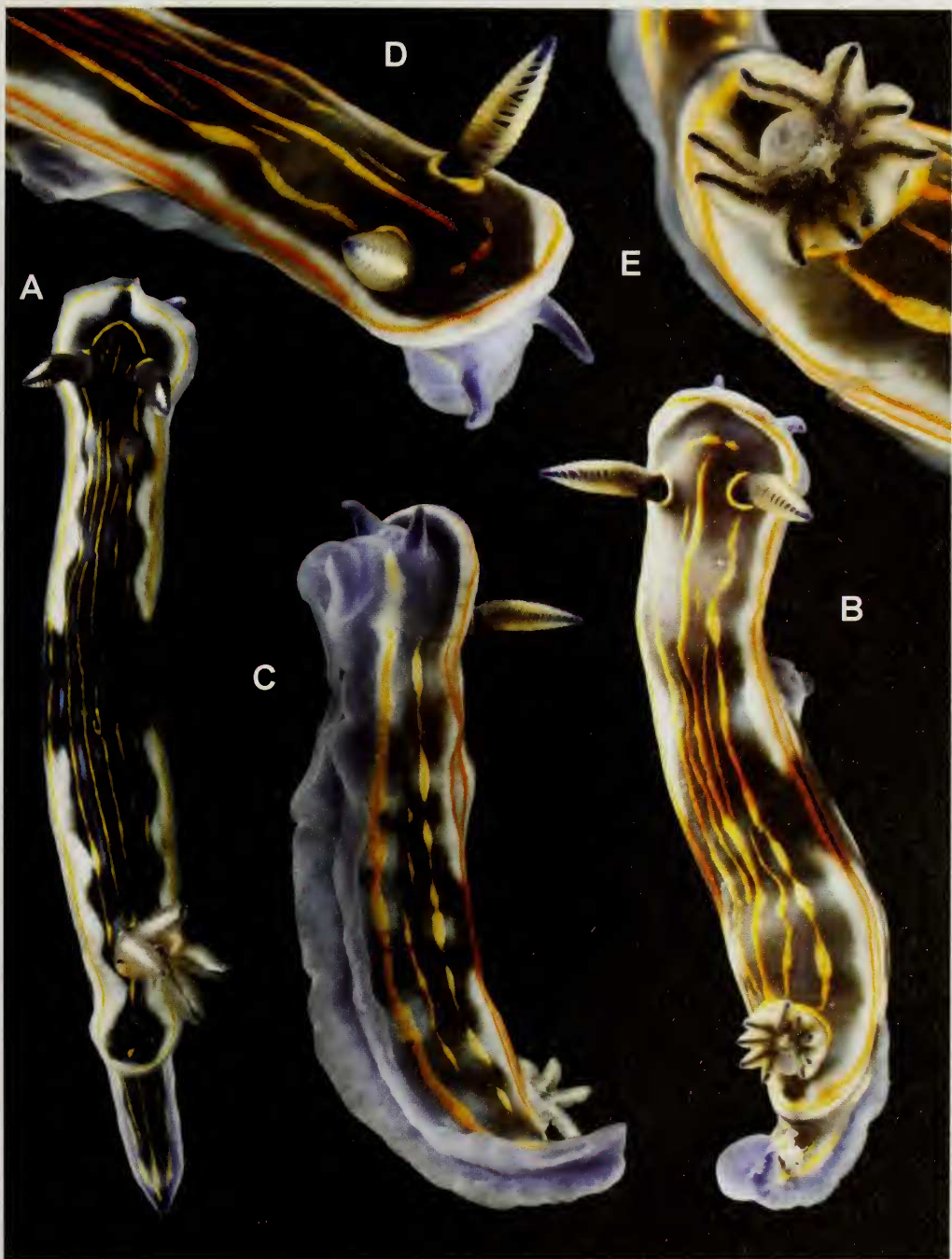
(Plates 7 B-E, 8 & 9 D)

**Material examinado:** Sec Ferry (type locality: 16°17'N 61°48'W), GS15, May 12, 2012, 1 specimen 18 mm long, collected in a rocky bottom at 27 m depth. Designated as holotype and deposited in the molluscan collections at the National Museum of Natural History in Paris (MNHN 26974). Dissected; the bucal bulb has been extracted to study the jaw and radula.

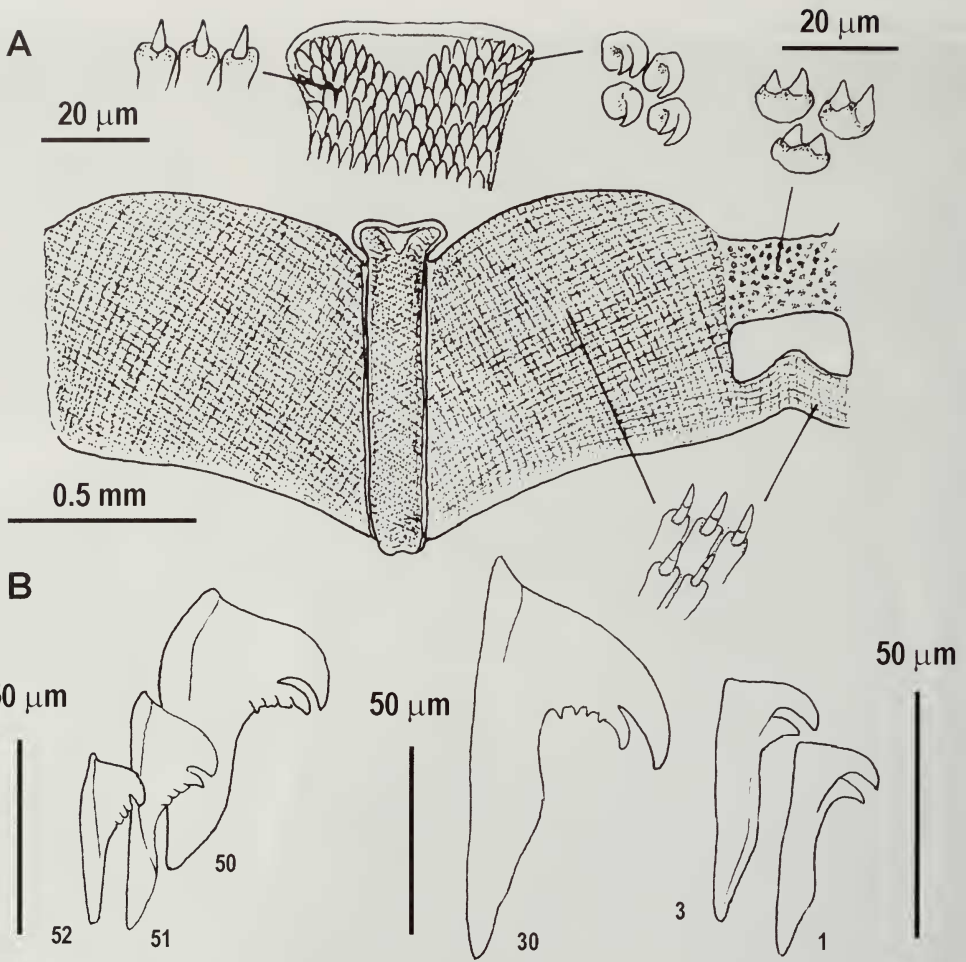
**Etimology:** Named for the shape of the rhinophores, whose lamellae are so beautiful that resemble a delicate work made with crystal from Lalique, France.

**Description:** Body elongate (5-6 times longer than wide), wider in the gill region. Mantle grayish blue with irregular longitudinal lines, composed of orange and yellow segments. There are 3 main lines, two of them range from each rhinophore (not joining it) to the gill, the central line exceeds the rhinophores, ending near the orange arc above. Between the 3 lines, there are another 2 fragmented and irregular lines. Orange segments occur in the middle of the body and in front of the rhinophores, the rest are golden yellow with some orange space. Mantle edge of the living animal with white areas located in the anterior, middle and posterior regions. This areas appear to be associated with the existence of MDFs, but these are absent in the holotype (8 mm fixed), which bears only 3 spherical and equal-sized MDFs behind the gill and 8, slightly smaller, in the region of the rhinophores (Plate 9 D). Mantle edge outlined with a thin and simple orange line in the areas with MDFs, when lacking there are two parallel lines of that color, more reddish in the middle lateral side (Plate 7 B). Body sides grayish dark blue with 2 longitudinal lines, yellow the upper one and orange the one below, both, widen and narrow in sections, like a string of sausages. Between them there is an extra thinner fragmented line. The lines on each side of the body near the foot edge, join in the tail. Mantle edge narrow and white, topped out with a simple orange line in the anterior and posterior regions of the body, with two overlapping orange lines on the sides, between the two previous regions. The rhinophores are a typical, delicate and elegant structure, the source of the specific epithet: sharp, very long, with the stalk and in the axis dark blue, with 14 spaced translucent orange lamellae. Rhinophoral and branchial sheaths very low, almost imperceptible, with a simple yellow ring in the opening. Gill composed of 9 unipinnate leaves, robust and small in relation to the size of the animal. Rachis purplish black on the inner side and covered by the white pigment of the lamellae on the outer side. The animal expands the branchial leaves folding them downwards. Foot violet blue, lighter than the body. Tail long, narrow and very dis-





**Plate 7.-** A. *Hypselodoris ruthae* Ev. Marcus & Hughes, 1974, dorsal view. *Hypselodoris lalique* Ortea & Caballer, new species, holotype: B. Dorsal view. C. Ventro-lateral view. D. Dorso-lateral view of the head. E. Dorsal view of the gills.



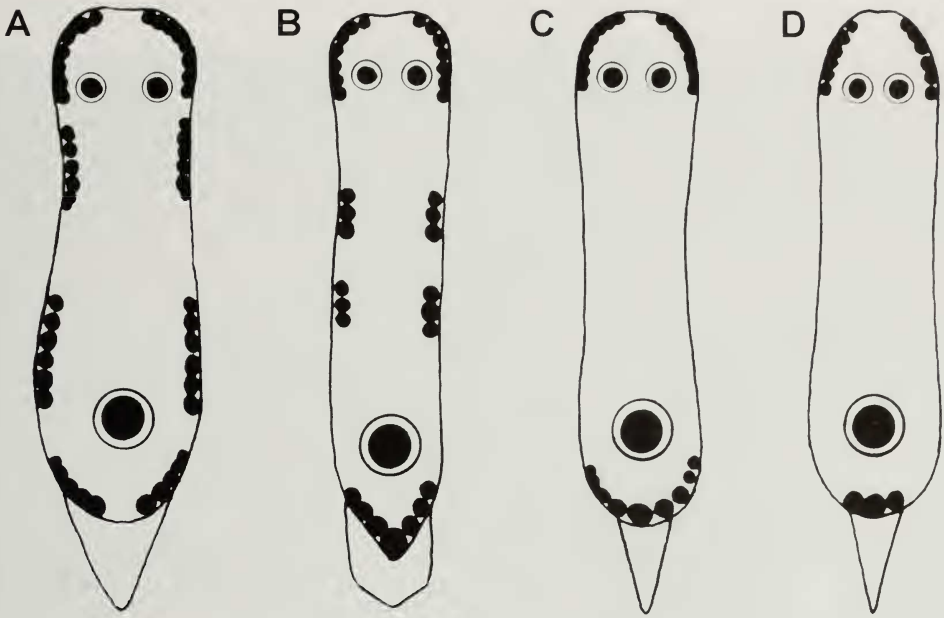
**Plate 8.-** *Hypselodoris lalique* Ortea & Caballer, new species, holotype: **A.** Jaw and jaw rodlets. **B.** Radular teeth (number in the figure).

tinctive, with the top half dark blue and a violet blue lower half (both separated by an orange line). When extended, it is projected behind up to 20% of the length of the body.

Gonopore high up on the right side of the body, above the upper orange line, with a ventral small triangular papilla. Oral appendages conical, purplish blue, joining at the base with the two main yellow lines on the flanks.

Jaw (Plate 8 A) composed of two large lateral pieces, which join ventrally through two bands that are separated by a gap; the anterior band bears flattened bicuspid uncini, and the posterior, simple rodlets of about 6 µm wide, equal to those present in the rest of the jaw. The latter band is folded in -V- and allows a greater opening of the structure. The dorsal odd region, which connects the lateral pieces of the jaw, extends forward, forming two rounded lobes coated with simple or bicuspid uncini on the edges.

Radular formula 55 x 52.0.52. Radula with amber teeth in the firsts 30 rows and transparent in the rest. Radular teeth bicuspid, lacking special distinctive characters (Plate 8 B). The



**Plate 9.**- Scheme of the arrangement of the MDFs in: **A.** *Hypselodoris alaini* Ortea, Espinosa & Buske, new species. **B.** *Hypselodoris fregona* Ortea & Caballer, new species. **C.** *Hypselodoris fortunensis* Ortea, Espinosa & Buske, new species. **D.** *Hypselodoris lalique* Ortea & Caballer, new species.

two cusps of the radular teeth, grow from the innermost teeth, to number 45 approximately, but the hook, short and wide, does not grow at the same rate, with a maximum of 5 denticles in tooth 35. Outermost lateral teeth gradually decrease in size, but do not degenerate so markedly as in other *Hypselodoris*.

**Remarks:** The characteristic jaw of *Hypselodoris lalique* Ortea & Caballer, new species, distinguishes it from the rest of his congeners in the Atlantic. At first glance, *Hypselodoris lalique* Ortea & Caballer, new species may resemble to *Hypselodoris ruthae* due to its dark blue background (violet blue), with parallel longitudinal lines, which are yellow to orange-red, on the mantle. In fact, it was initially determined as *H. ruthae*. Nevertheless, a comparative study of both species shows that, at equal size, they are different: *H. ruthae* has double the number of yellow lines on the mantle, half of the branchial leaves and club-shaped rhinophores, which are biconical and white stained in the upper half of each side, quite different from the stylized rhinophores with spaced lamellae of *Hypselodoris lalique* Ortea & Caballer, new species.

The jaw of *Hypselodoris espinosai* has the two lateral pieces fixed beneath the odd ventral region and *Hypselodoris muniani* Ortea & Valdes, 1996, from Prince Island, has the jaw uncini with a similar distribution as in *Hypselodoris lalique* Ortea & Caballer, new species, but the three species are easy to distinguish by the external anatomy and coloration.

With *Hypselodoris alaini*, *Hypselodoris fortunensis*, *Hypselodoris fregona* and *Hypselodoris lalique*, 15 are the species of the genus described in the Atlantic (53 % of the total), 7 of them in the Caribbean, with the objective of clarify the taxonomy of *Hypselodoris* in the area. The previous are:

*Hypselodoris espinosai* Ortea & Valdés, 1996. Type locality: Puerto Morelos, Mexico. Holotype in MNHN. *Avicennia*, Supplement 1: 139-142, figures 12 E, 109 -111.

*Hypselodoris olgae* Ortea & Bacallado, 2007. Type locality: Playa Flamenco, Punta Majana, Golfo de Batabanó, Cuba. Holotype in the Natural History Museum in Tenerife. *Revista de la Academia Canaria de Ciencias*, XVIII (3-4): 54-55, Plate 1, figures 1-3.

*Hypselodoris samueli* Caballer & Ortea, 2012. Type locality: Entrance of the coastal lagoon of El Ocho, Morrocoy, Venezuela. Holotype in MNHN. *Revista de la Academia Canaria de Ciencias*, XXIII (3): 93-106, Figures 1-4.

Family DISCODORIDIDAE Bergh, 1891

Genus *Geitodoris* Bergh, 1891

*Geitodoris pusae* (Marcus, 1955)

GM39, Anse a la Barque, under a rock at 1 m depth.

Genus *Diaulula* Bergh, 1879

*Diaulula hummelincki* (Marcus & Marcus, 1963)

GR59, Îlet Fortune, rocky bottom between 1.5 and 7 m depth.

Genus *Sclerodoris* Eliot, 1904

*Sclerodoris worki* (Marcus & Marcus, 1967)

GR63, pointe Anse à la Barque, rocky bottom at 3 m depth.

## Suborder AEOLIDACEA

Family FLABELLINIDAE Bergh, 1889

Genus *Flabellina* Voigt, 1834

*Flabellina hamanni* Gosliner, 1994

GR66, nord ilet Fajou, rocky bottom between 20 and 24 m depth.

Genus *Noumeaella* Risbec, 1937

*Noumeaella kristenseni* (Marcus & Marcus, 1963)

GR75, Îlet Fortune, rocky bottom between 1.5 and 7 m depth.

Family FACELINIDAE Bergh, 1889

Genus *Dondice* Er. Marcus, 1958

*Dondice parguerensis* Brandon & Cutress, 1985

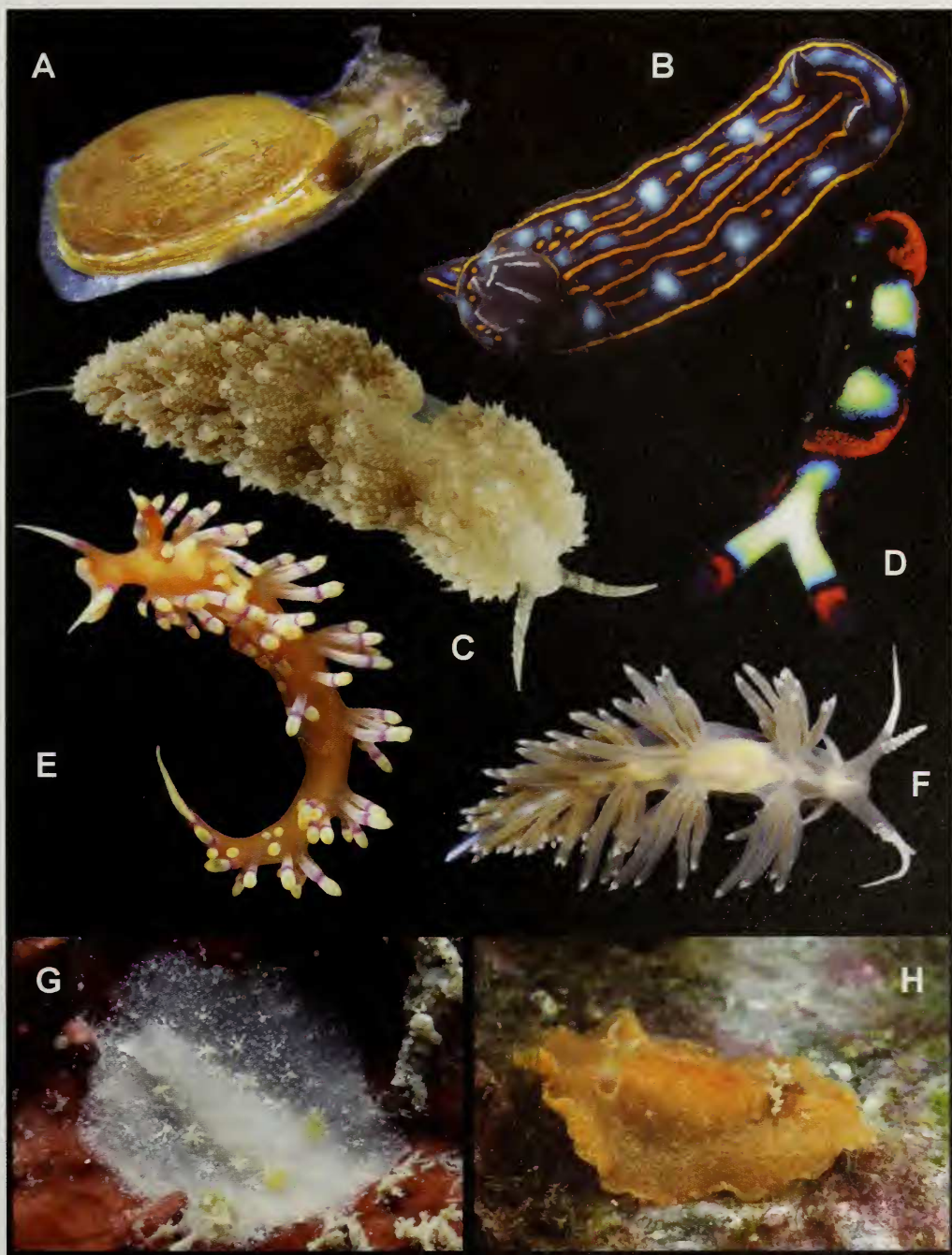
GR73, Mangrove Rivière Salée; meadows with sediments meadows and sediments with *Cassiopea* spp. in a coastal lagoon with mangrove, up to 7 specimens on each jellyfish with spawns.

Family TERGIPEDIDAE Bergh, 1889

Genus *Catriona* Winckworth, 1941

*Catriona maua* Marcus & Marcus, 1960

On hydroids at the dock of the Marine Biological Station of the University of Guyana.



**Plate 10.-** A. *Bulla solida*. B. *Hypselodoris espinosai*. C. *Millereolidia agari*. D. *Thuridilla picta*. E. *Flabellina hamanni*. F. *Dondice parguerensis*. G. *Sclerodoris worki*. H. *Geitodoris pusae*.

Family AEOLIDIIDAE Gray, 1827

Genus *Millereolidia* Ortea, Caballer & Espinosa, 2004

*Millereolidia agari* (Smallwood, 1910)

GM21 Pointe Grigri (Port-Louis), rocky bottom at 2 m depth.

Genus *Berghia* Trinchese, 1877

*Berghia rissodominguezi* Muniain & Ortea, 1999

GR75, Îlet Fortune, rocky bottom between 1.5 and 7 m depth.

## Subclase SACOGLOSSA

## Orden PLACOBANCHACEA

Family PLACOBANCHIDAE Gray, 1840

Genus *Bosellia* Trinchese, 1891

*Bosellia curasoeae* Marcus & Marcus, 1970

GR56, îlet Gosier, clastic rocky bottom between 1 and 5 m depth.

Genus *Thuridilla* Bergh, 1872

*Thuridilla picta* (Verrill, 1901)

GR50, Lagon de Pet.

Genus *Elysia* Risso, 1818

*Elysia jibacoaensis* Ortea, Caballer & Espinosa, 2010

(Plate 14 A-B)

**Material examined:** Grand Cul de Sac Marin (GR4: 16°21.8'N 61°29.66'W), May 4, 2012, 1 specimen 6 mm long, collected in a coralline bottom at 23 m depth.

The specimen captured has all the distinctive characters of the holotype described in ORTEA, MORO, CABALLER & ESPINOSA [14]: Body light green, slightly translucent, with bright red spots. Parapodia lacking differentiated vessels inside, of the same color as the rest of the body. Reno-pericardial area oval, with red dots. Rhinophores long, tapered, with the opening bordered by a thin black line, similar to these under the edge of the parapodia, under which, there are broken, irregular white sacs. The foot does not have the true sole differentiated from the parapodial sole and both have red dots on a light green background. True sole with straight and parallel green lines. Parapodial sole with irregular green lines.

When the animal moves, projects the rounded edge of the foot ahead of the head. The animal only moves in two ways: very fast or very slow. When resting, it flattens as if it was a species of *Bosellia*, opening the parapodia and shrugging back the rhinophores, or it flattens and rolls on itself as a spiral turn.

To date, known only from its type locality in northern Cuba, this is the second capture of the species since its original description and the first record in Guadalupe.

*Elysia ellenae* Ortea, Espinosa & Caballer, new species  
(Plates 11 B-E & 12)

**References:**

*Thuridilla* sp.: REDFERN, [16]: species 797.

*Elysia* sp. 4: TURNER, EVANS & ABGARIAN [18]: 54.

**Material examined:** South of Port Louis and west from Petit Canal (type locality: 16°24.07'N 61°31.27'W), GD29, May 15, 2012, 1 specimen 9 mm long, collected at 4 m depth, designated as holotype and deposited in the molluscan collections at the National Museum of Natural History in Paris (MNHN 26975). Petic Cul de Sac Marin, ilet Gosier, (16°11.8'N 61°29.66'W), GB1, May 3, 2012, 1 specimen 8 mm long, collected at 6 m depth, dissected to extract the radula. Entrance of Grotte Amerdier (16°30.04'N 61°28.79'W), GS25, May 19, 2012, 2 specimens 5 and 7 mm long, collected at 16 m depth. All the specimens collected in rocky bottoms with seaweed.

**Etimology:** Named in honor of Ellen Strong, researcher at the Smithsonian Institution, Washington, charismatic leader of the molecular systematic's team "Charlie's Angels", in Karubenthos-1, synonymous to order, discipline, harmony and sympathy (Plate 3).

**Description:** Body pale green, with a dark green network of irregular density and some papillae. Sometimes it bears a brownish hue, with pink and white fuzzy areas. Inner side of the parapodia with red dots and bright blue reflections; these are missing on the sides of the body, which have a dark green background and bright white lumps and papillae. The size of the papillae decreases from the top of the flanks, to the bottom. Rhinophores cylindrical slightly expanded distally, with white papillae and a dorsal green granules, more or less dark, which are absent in the apex. Inner side white and green. Rhinophores may have a red transversal band towards the middle. Head with two rounded lobes on the nose. Anterior edge of the foot with black dots (a mustache) which do not disappear with fixation. A distinctive character of this species is the striking red-orange line, whole or fragmented, which starts on the frontal-inner side of the eyes, where there is an aqua blue stain, and continues to each rhinophore, from base to apex. Parapodia end at the posterior end of the animal, there is no tail. Folding of the parapodia over the body very distinctive: three to four folds, two on each side of the body, or two on one side and an odd one in the other. Edge of the parapodia outlined by a reddish line, more or less prominent, with small white spheres aligned. Reno-pericardial area globose (Plate 11 E), bright white stained, reaching the edge of the base of the parapodia, which embrace it ahead; this is more obvious in fixed animals. Mantle vessels thick and barely branched (Plate 12 A), composed of two major pairs, one on each side of the reno-pericardial area; arising from the anterior and posterior regions. Sole of the foot green with scattered bright white dots. True sole of the foot continuous with the parapodial sole (Plate 11 A), transition zone not perceptible in the living animal; it is only marked by a slight transversal arched wrinkle, at the beginning of the parapodia. In fixed specimens the true sole is heart-shaped (Plate 12 B) and contrasts with the parapodial sole (Plate 11 C).

Radular teeth awl-shaped, with a thick apophysis at the base, which fits in the next tooth. Radula (Plate 12 C-D) short in the 8 mm long specimen, with 6 teeth in the ascending series, 9 in the descending and 3 in the ascus. All the teeth with the same shape and size, except for the ones in the ascus, that are slightly smaller.

This species moves crawling, not jumping, not swimming. When at rest, it flattens and expands the parapodia, taking the appearance of a heart-shaped leaf.

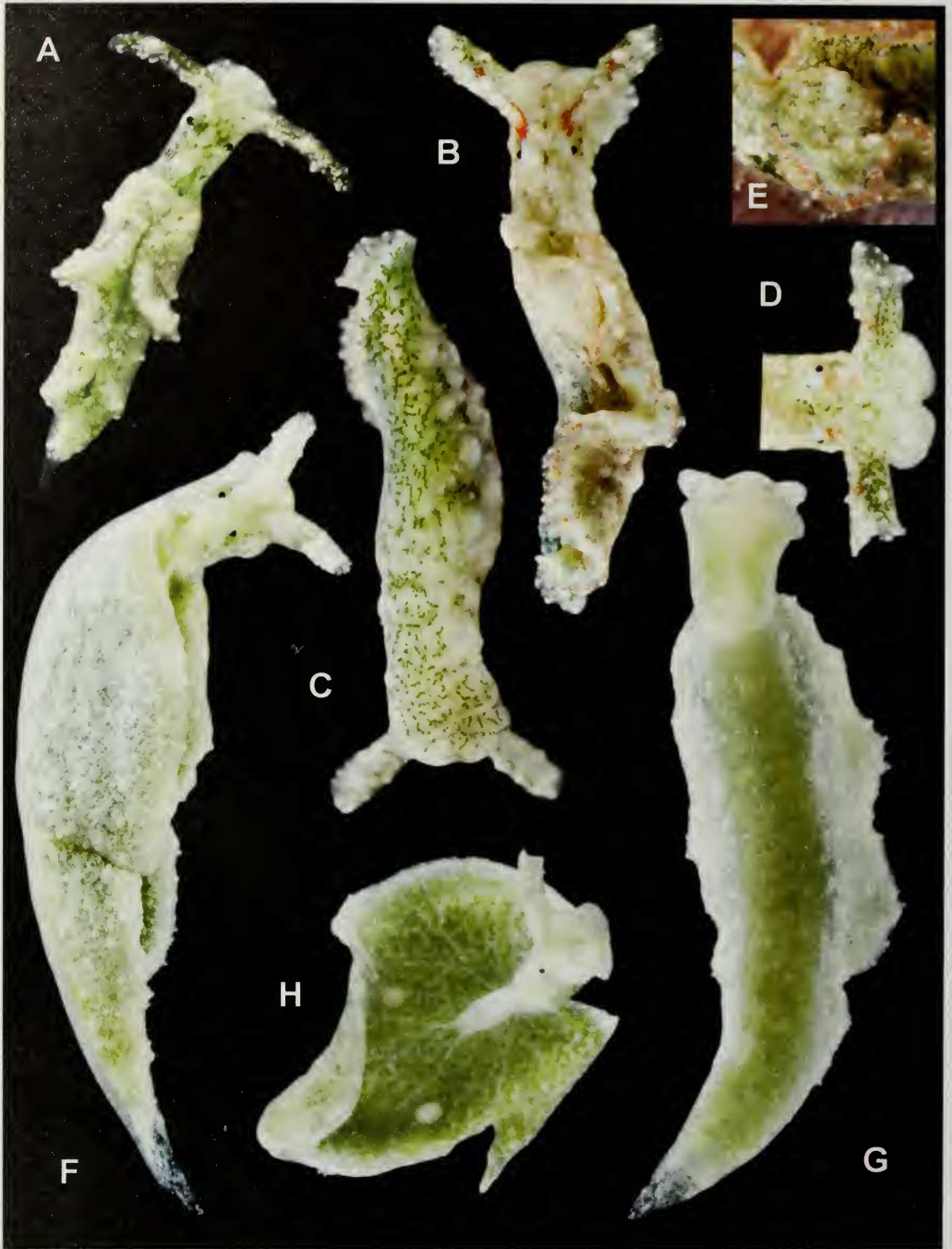
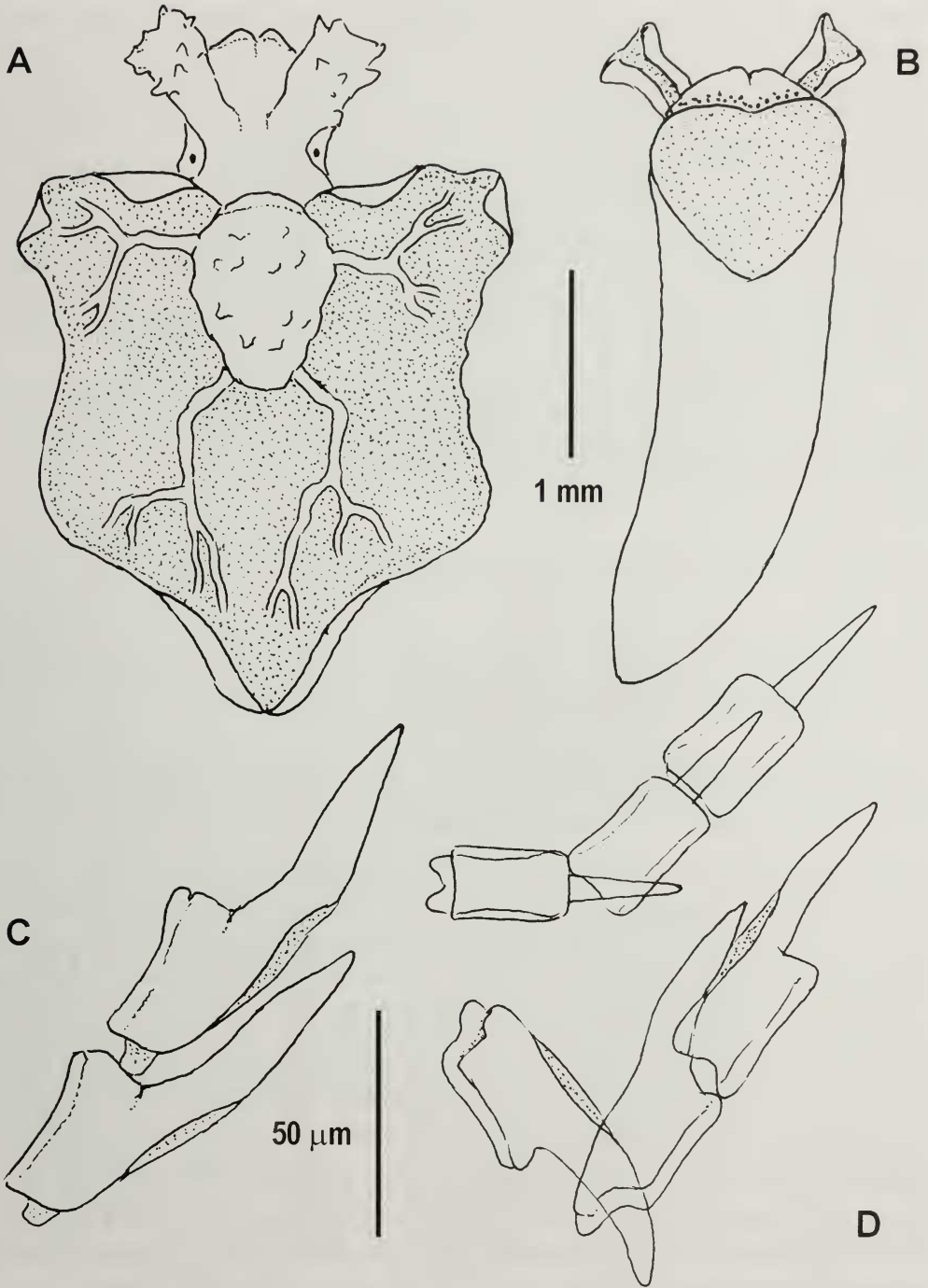


Plate 11.- A. *Elysia purchoni* Thompson, 1977, 7 mm. *Elysia ellenae* Ortea, Caballer & Espinosa, new species, 8 mm: B. Dorsal view. C. Ventral view. D. Detail of the head. E. Detail of the heart. *Elysia leeanae* Caballer, Ortea & Espinosa, new species, holotype: F. Dorso-lateral view. G. Ventral view. H. Animal swimming.





**Plate 12.-** *Elysia ellenae* Ortea, Caballer & Espinosa, new species: **A.** Mantle vessels. **B.** Sole of the foot. **C.** Radular teeth. **D.** Ascus.

**Remarks:** The coloration of *Elysia ellenae* Ortea, Espinosa & Caballer, new species, is very characteristic and distinguishes it from all known species in the Caribbean. It bears a radula that has similar teeth to those of *Elysia purchoni* Thompson 1977 and *Elysia jibacoensis*, whose radulas are short (11 and 13 teeth, up to 100  $\mu\text{m}$ ), but in *E. purchoni* there is a mish-mash of teeth in the ascus and *E. jibacoensis* has 5 teeth arranged helically, quite different from the ascus of *E. ellenae* Ortea, Espinosa & Caballer, new species, with only three aligned teeth. Additionally, in this new species, all the functional teeth have the same size, unlike the other two species in which they are progressively reduced.

REDFERN [16] illustrates a 12 mm specimen of this new species under the name *Thuridilla* sp., the largest known size. TURNER, EVANS & ABGARIAN [18] illustrate specimens of *Elysia ellenae* Ortea, Espinosa & Caballer, new species, from the Virgin Islands under the name *Elysia* sp. 4. Thus, the distribution of this species includes Bahamas, Virgin Islands and Guadeloupe.

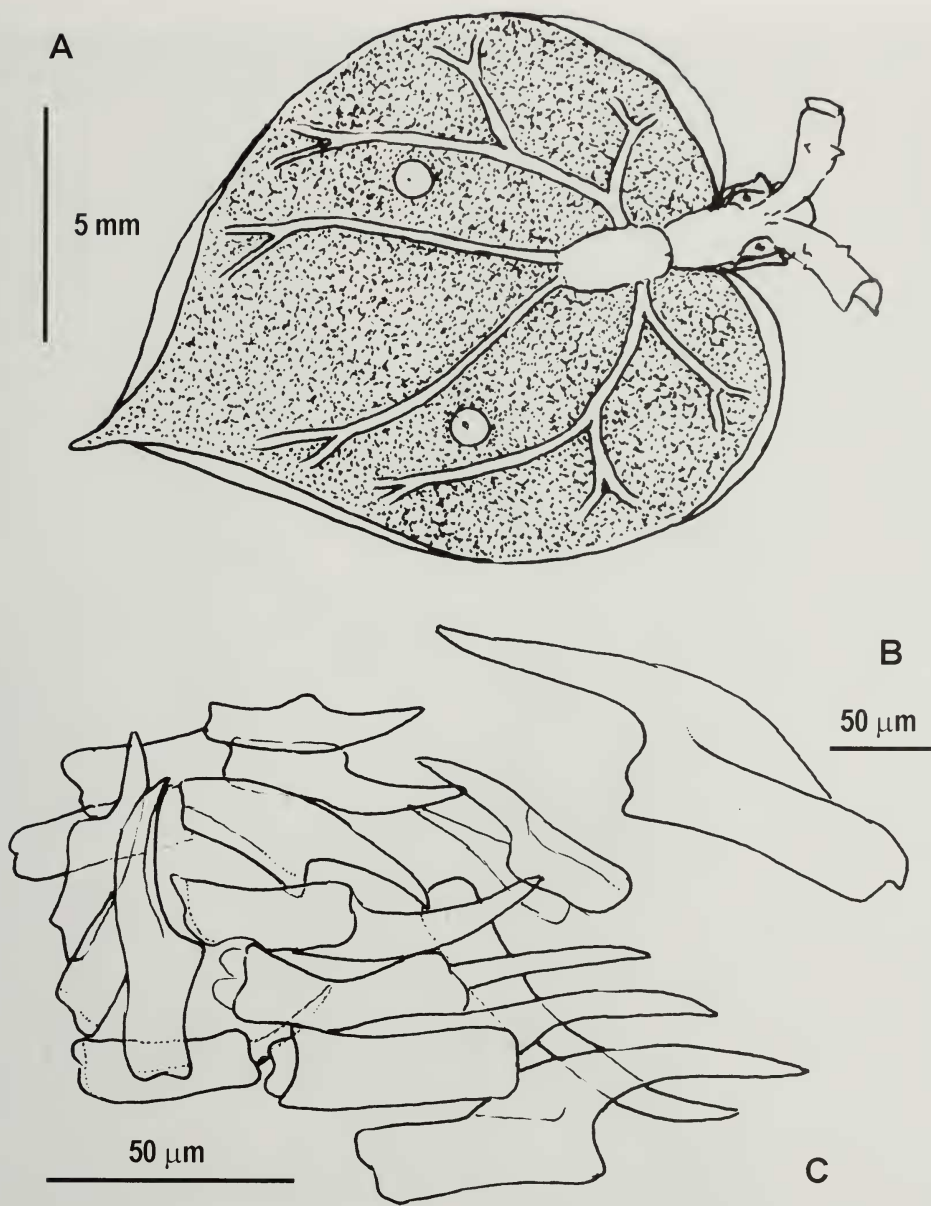
ORTEA *et al.* [14] redescribed *Elysia purchoni* based on animals from Cuba and Costa Rica ESPINOSA & ORTEA [5], to provide stability to one species originally described from a single specimen of 5 mm long, emerging from a sample of algae in the laboratory of Port Royal, Jamaica (THOMPSON [17]).

***Elysia leanneae* Caballer, Ortea & Espinosa, new species**  
(Plates 11 F-H & 13)

**Material examinado:** Petit Cul de Sac Marin (type locality, 16°11.8'N 61°29.66'W), GB1, May 3, 2012, 1 specimen 15 mm long, collected at 3 m depth. Designated as holotype and deposited in the molluscan collections at the National Museum of Natural History in Paris (MNHN 26978).

**Etimology:** Named in honor of Lee Ann Galindo, PhD student in MNHN and component of the molecular systematic's team, "Charlie's Angels", in Karubenthos-1. When her husband Manuel was photographing this unique species, it joyfully started to swim.

**Description:** Body white (Plate 11 F)), with grooves in the mantle which are dark green at the bottom, that give a faded green hue to the animal. Sides of the body, uniform bright white in the upper area of the parapodia, bright white over a green background in the middle and green near the parapodial sole (Plates 11 F-G). Edge of the parapodia thickened, with a single row of isolated white papillae; thin and conical, the apex of which, is expanded as a bulb. Inner side of the parapodia light green, with a bright blue hue, small white granules and two cream colored sacs, one on each side (Plate 11 H). Vessels inside the parapodia white (Plate 11 A). There are three main branches (Plate 13 A): anterior, middle and posterior, which arise from the region reno-pericardial region. Reno-pericardial region oval and small relative to the dimensions of the animal. Tail small, after the end of the parapodia. Head and neck approximately one fifth of the body length. Rhinophores tubular, milky white, with some small white papillae and a discolored band near the apex and on the inner edges. They widen or narrow at the apex depending of the animal's position. When resting they are wide opened and bended upward and backward, covering his eyes, as if the light bothered him. Anterior edge of the foot broad, rounded and robust, with sharp angles and some black spots. Projected forward of the head. The animal sticks with it to the bottom and moves, lifted from the substrate, not using the parapodial sole.



**Plate 13.-** *Elysia leeanneae* Caballer, Ortea & Espinosa, new species: **A.** Mantle vessels. **B.** Radular teeth. **C.** Ascus.

True sole of the foot whitish, muscular and well differentiated from the parapodial sole, which is green and extends beyond the end of the parapodia (Plate 11 G).

Buccal bulb 0.5 x 0.3 mm in the fixed holotype. Radular teeth about 80  $\mu$ m, regular and equal to each other in shape and size (Plate 13 B), with the cutting edge sharp awl-shaped, in right angle with the anterior end of the base. Radula with 29 teeth: 10 teeth in the ascending

series, 19 in the descending and at least 16 in the ascus, piled up disorderly (Plate 13 C). Penis smooth, with a distal conical shortening, with different muscular density, as a small glans.

This species is probably nocturnal: it runs away from the light or rolls up when it is lighted up and it is active in the dark.

**Remarks:** The parapodial sacs of *Elysia leanneae* Caballer, Ortea & Espinosa, new species, are a common character with *Checholyisia patina* (Marcus, 1980), but this species has a penial stiletto and a reno-pericardial region globose ahead and depressed-elongated in the back, surpassing the position of the parapodial sacs. Additionally, according to ORTEA, CABALLER, MORO & ESPINOSA [10], the radular teeth of *C. patina* have denticles on the cutting edge, but are smooth in *Elysia leanneae* Caballer, Ortea & Espinosa, new species, similar to those of *Elysia zuleicae* Ortea & Espinosa, 2002, but in this species the teeth decrease in size on the radula and they are not piled up disorderly in the ascus. The radula of *E. zuleicae* has 10 teeth in the ascending series and 24-25 in the descending, 30% more than *Elysia leanneae* Caballer, Ortea & Espinosa, new species. The teeth piled up disorderly in the ascus resemble those of *Elysia purchoni*, but in this species the size varies in the ascending and descending series; the bigger teeth are three times as big as the smaller, it has black spots in the snout and red spots in the body.

CARMONA, MALAQUIAS, GOSLINER, POLA & CERVERA [2] apply molecular techniques to try to bring light on the complex systematic of the Caribbean species of Plachobranchidae, but they introduce more confusion by including *Elysia subornata* Verrill, 1901 in the analysis, an unrecognizable species, whose distinctive character, a thin black line on the edge of the parapodia, is common to several species excluded from the analysis: *Elysia cauze* Marcus, 1957, *Elysia nisbeti* Thompson, 1977, *Elysia pratensis* Ortea & Espinosa, 1996 and *E. zuleicae*, among others. They also confirm, the presence of *Elysia timida* (Risso, 1818) in the Caribbean, something that had been previously done by ORTEA, MORO & ESPINOSA [12] using anatomical data.

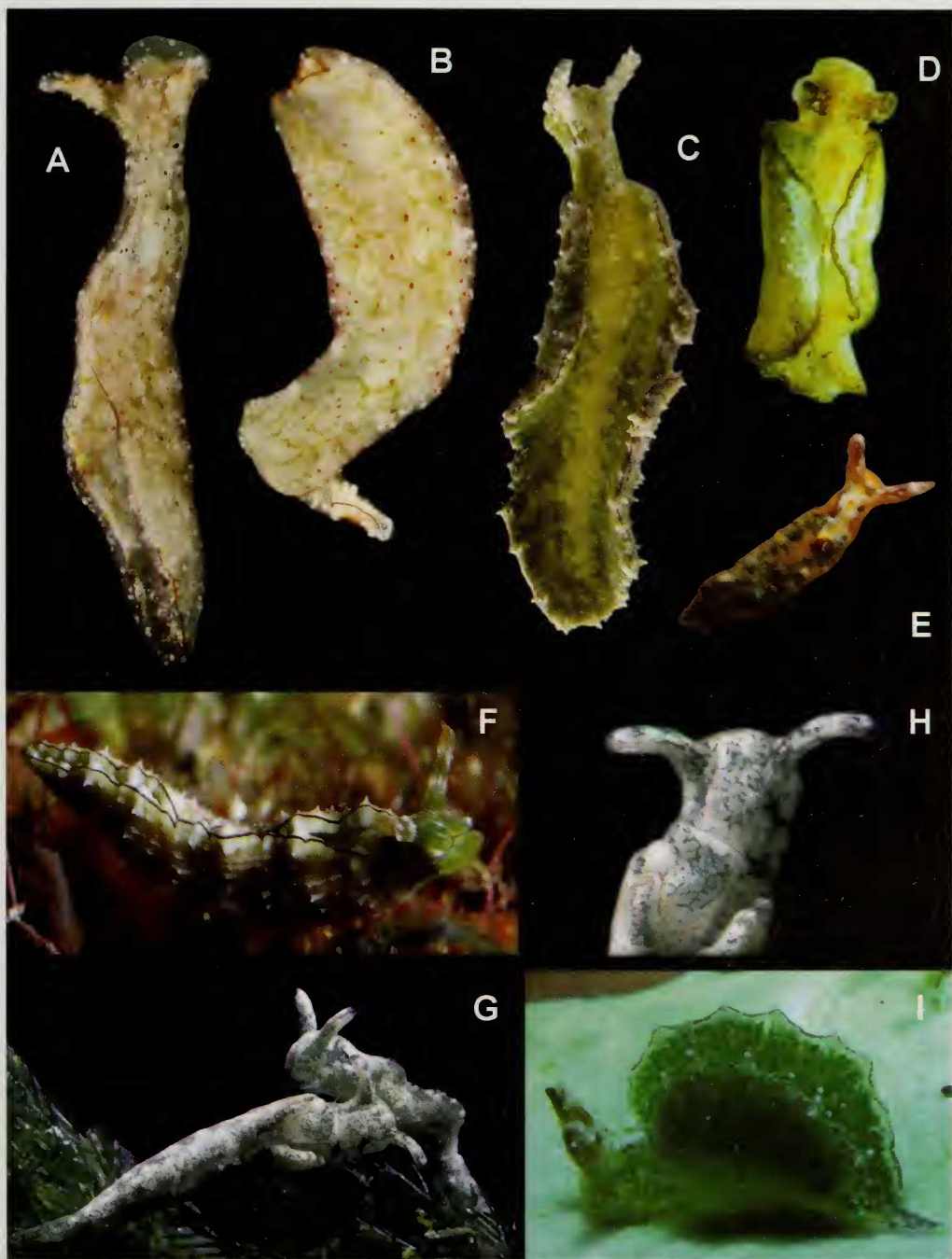
The most recent example of the difficulty in distinguishing the Caribbean species of *Elysia* in absence of anatomical data is shown in REDFERN [16], who illustrates *Elysia purchoni* and *Elysia timida* under the name *Elysia cornigera* Nuttall, 1989 (species 783A and 783B respectively). In the same work, *Checholyisia patina* (with parapodial sacs) is illustrated as *Elysia papillosa* Verrill, 1910 (species 787AB), *Elysia annedupontae* Ortea, Espinosa & Caballer, 2005 (lacking parapodial sacs) as *Elysia patina* (species 788). *Elysia cauze* (species 790A) and *Elysia nisbeti* (species 790B) are illustrated under the name *Elysia subornata* and, finally, *E. papillosa* as *Elysia* sp.

With these two new taxa, 10 are the valid species that have recently been described in the Caribbean, whose types are deposited in: ACN (National Aquarium of Cuba), IES (Institute of Ecology and Systematics, Havana, Cuba); TFMC (Natural History Museum in Tenerife, Canary Islands, Spain); MZUC (Museum of Zoology, University of Costa Rica), none of which has been included in the analysis of CARMONA *et al.* [2]:

*Elysia pratensis* Ortea & Espinosa, 1996. Type locality: Puerto Morelos, Quintana Roo, Mexico. Holotype in TFMC (MO-000185). *Avicennia*, (4-5): 116-121, figures 1-2.

*Elysia eugeniae* Ortea & Espinosa, 2002. Type locality: Manzanillo, Limón, Costa Rica. Holotype in MZUC. *Avicennia*, 15: 130-133, figures 1-2, plate 1A.

*Elysia zuleicae* Ortea & Espinosa, 2002. Type locality: Marina Hemingway, Cuba. Holotype in ACN. *Avicennia*, 15: 133-139, figures 3-7, plate 1B.



**Plate 14.-** *Elysia jibacoensis* Ortea, Caballer & Espinosa, 2011: **A.** Dorsal view. **B.** Ventral view. **C.** *Elysia annedupontae* Ortea, Espinosa & Caballer, 2005. **D.** *Elysia deborahae* Ortea, Espinosa & Moro, 2005. **E.** *Elysia sarasuae* Ortea & Espinosa, 2011. **F.** *Elysia pratensis* Ortea & Espinosa, 1996. **G-H.** *Elysia eugeniae* Ortea & Espinosa, 2002. **I.** *Elysia zuleicae* Ortea & Espinosa, 2002.

- Elysia annedupontae* Ortea, Espinosa & Caballer, 2005. Type locality: Ensenada de Bolondrón, Guanahacabibes, Cuba. Holotype in IES. *Vieraea*, 33: 502-505, figure 3, plate 1B.
- Elysia deborahae* Ortea, Espinosa & Moro, 2005. Type locality: María La Gorda, Guanahacabibes, Cuba. Holotype in IES. *Vieraea*, 33: 509-511, figures 4-5, plate 1D.
- Elysia jibacoaensis* Ortea, Caballer & Espinosa, 2011. Type locality: Playa de Jibacoa, Mayabeque, Cuba. Holotype in IES. *Revista de la Academia Canaria de Ciencias*, XXII (3): 203-205, Plates 3-4.
- Elysia orientalis* Ortea, Moro & Espinosa, 2011. Type locality: Playita de 14-16, Miramar, Havana, Cuba. Holotype in IES. *Revista de la Academia Canaria de Ciencias*, XXII (3): 205-206, plate 5.
- Elysia sarasuae* Ortea & Espinosa, 2011. Type locality: Playa Rancho Luna, Cienfuegos, Cuba. Holotype in IES. *Revista de la Academia Canaria de Ciencias*, XXII (3): 206, plate 6.

VALDÉS *et al.* [19] synonymized *Elysia eugeniae* with *Elysia canguzua* Marcus, 1955 from Brazil, in whose original description is expressly stated, that the rhinophores have the shape of rabbit ears. To consider that *E. eugeniae*, with tubular rhinophores, rolled up like a parchment, is the same species as *E. canguzua*, is an incomprehensible synonymy that must be rejected.

#### 4. DISCUSSION

In this work, 23 species are added to the inventory of the sea slugs from Guadeloupe (ORTEA *et al.* [11]); 15 new records (12 opisthobranchia and 27 sacoglossa) and 8 new species (6 opisthobranchia and 2 sacoglossa). Additionally, a supraspecific taxa has been named, *Karukerina* Ortea, new genus. Thus, the inventory of the sea slugs from Guadeloupe reaches 149 species (122 opisthobranchia and 27 sacoglossa), collected in the two parts of the expedition, Karubenthos-1 and 2 (may and December, 2012), of which 9 are new species and 100 are new records for the archipelago.

The locality with higher sea slugs species richness in Karubenthos-2, was îlet Fortune, where 7 species were collected, in addition to the 19 collected in Karubenthos-1 (ORTEA *et al.* [11]); the 26 species recorded in this locality, account for 17.8 % of the total inventory.

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These additions to the inventory of the sea slugs from Guadeloupe (Karukera) have been made possible thanks to the support provided by the Guadalupe National Park divers during the small mission Karubenthos-2 (December 2012) and especially to Didier Baltide, always attentive to solve the problems before they occur. Alice Leblond took care of the intendance to the last detail, including the traditional bokyt. The scientific coordination of the expedition has been possible thanks to the unflagging efforts of Florence Rousseau and to the enthusiasm of Bruno de Reviers (MNHN, Paris), with the support of Hervé Magnin (Guadalupe National Park). The photos of *Thuridilla picta*, *Aplysia brasiliiana* and *Bulla solidula* are owed to Philippe Maestrati. The overall scientific coordination of the project and the campaigns was conducted by our friend and colleague Philippe Bouchet. Our sincere gratitude to each and every one of the participants.

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